

REMARKS

The Applicant wishes to thank the Examiner for his attention to this patent application.

The amendments to the specification are intended to correct minor typographical errors. No new subject matter has been introduced into the application by way of this amendment.

The claims have been cancelled and re-presented as claims 17-32.

Claim 19 has been amended for clarity. Claim 21 has been re-arranged in a proper method claim form, and claim 32 has been re-arranged in a proper apparatus claim form.

The Applicant wishes to amend an inadvertence in Figure 2, by changing the word "input" in the second box to read --output--. This amendment is fully supported by the specification, claims and Figures 1, 3-5 as filed, which all clearly indicate, define and illustrate that frequency measuring device 30 measures the output frequency and not the input frequency.

Response to claim rejection under 35 USC § 102

The Examiner alleges that US Patent 6,304,517 ("Ledfelt") anticipates claims 17-32 of the present application. The Ledfelt reference describes a real time clock RTC 220 for a radio-communication device, which provides the time (seconds, minutes, hours) and the date. The object of the Ledfelt reference is to correct fixed errors/inaccuracies of the oscillating frequency of RTC crystal and other components of the device, occurring during manufacture. The reference teaches correcting the time/date at calculated intervals by applying precisely calculated corrections. An additional, highly reliable time source, namely the internal clock 270 is used as a reference for the RTC.

The present invention is concerned with correcting the output frequency of frequency source 20 (the channel frequency) in a closed frequency control loop.

To this end, the output frequency is measured, the measurement is fed back to a controller which determines the true (current) frequency of the crystal and adjusts the output frequency based on this true value and on a desired frequency value.

General remarks:

A. The Office Action does not specify which items/steps of the reference anticipate or render obvious which elements of the claim. It is unclear which one of the frequencies described in the reference are considered by the Examiner as the original frequency, the first frequency, the output frequency, the desired frequency, or which item is considered the frequency source, or the frequency measurement device, etc.

B. The Examiner cites a respective large portion of the text of the reference as being pertinent to an entire phrase of a claim. In all cases, the Applicant could not find an exact description of the respective claim phrase. Also, since the elements of a claim often appear in different phrases of a claim, the Applicant's task of providing clear arguments for all possible combinations of elements became quite laborious and unwarranted.

C. The Office Action considers that independent method claim 17, independent apparatus claim 27 and dependent claims 29 and 32 have a similar scope, and rejects these claims together, and based on the same cited fragments of the reference. The Applicant disagrees that the scope of these claims is identical and discusses these claims separately.

D. Finally and most importantly, in order to find anticipation the US patent law and practice requires that all elements of a claim be exactly described by a single reference. This is not the case here; the Applicant believes that there are at least the following differences between the teachings of the reference and the elements defined by the claims:

Independent method claim 1

1. The preamble of claim 17 defines a method of calibrating a radio which has a frequency source 20 that produces a first signal of a first frequency (output frequency on Figure 2), by multiplying a second signal of an original frequency by a multiplier.

As best understood, the Examiner recons in his rejection that RTC 220 reads on the frequency source of claim 17. However, the function of source 20 of claim 1 is to provide a precise channel frequency, while the function of the RTC 220 of the reference is to provide a time/date signal. As such, the design and the design requirements of the frequency source of claim 1 and the RTC of the references are quite different.

2. Furthermore, the frequency source 20 as claimed, multiplies a second signal of an original frequency with a multiplier value. As clearly described in col. 7 line 3 to col. 9, line 16, RTC 20 calculates the difference between the crystal frequency and that of a reference clock 270 to determine a count value. The count value is then used to calculate the length of time between corrections. Equations 1-7 show in detail how the time interval and time corrections are calculated.

3. Step a) defines determining the original (input) frequency. The text in col. 4, lines 11-67 indicated by the Examiner as pertinent to step a) describes how RTC 220 determines the count value as the difference between the frequency of the crystal and that of reference clock 270, which is different from determining the original frequency recited by step a) of claim 17.

4. Step b) of claim 17 defines determining a corrected multiplier value based on the original frequency determined in step a). The reference is not concerned with determining such corrected multiplier value in col. 6, lines 5-57. Rather, the reference describes the steps performed by the RTC 220 for

calculating an "adjusting period", representing the time between corrections.

5. Step c) of claim 17 defines producing an output signal of an output frequency approximately equal to a desired frequency.

The Examiner indicates that this step is disclosed by the text in col. 9, lines 28-45 of the reference. However, this referred to text describes dividing the input frequency twice by a value N to obtain the time/date information. It also describes operation of counters 510 and 540, comparator 560 and register 550, and how the time/date information is corrected by applying calculated increments/decrements.

None of the above features are the object of claim 17, or more particularly of step c) of claim 17.

In view of A-D and 1-5 above, the Applicant considers that rejection of independent claim 17 under 35 § 102 is improper.

Method claims 18-22 depend on independent claim 17 and define additional elements that are not described exactly by the reference.

Thus, claim 18 defines measuring the output frequency and dividing it by the multiplier value to obtain the input frequency. The text in col. 5, lines 11-67 cited by the Examiner describes determining the count value, and the text in col. 7 line 3 to col. 9 line 16 describe how RTC 20 determines the count value, which is then used to calculate the length of time between corrections. Equations 1-7 show in detail how the time interval and time corrections are calculated.

Method claim 19 defines dividing the desired frequency by the input frequency to obtain the current multiplier value. The reference does not describe dividing the desired frequency by the input frequency. The text in col. 7 line 3 to col. 9 line 16 describes how RTC 20 determines the count value, which is then used to establish the length of time between corrections. Equations 1-7 show in detail how the time interval and time corrections are calculated.

Claim 20 defines the step of storing the original frequency, while the text

in col. 5, lines 45-55 describes how the count value is stored in memory 245 for later use in calculating a value that represents the lengths of time between corrections.

Regarding claim 21, the Applicant could not find any reference to a frequency synthesizer in col. 5, lines 11-17.

As dependent on claim 17, and further in view of the above noted differences, the Applicant considers that rejection of dependent claims 18-22 under 35 § 102 is improper.

Independent method claim 23

The same differences 1-5 as above are noted between the elements of this claim and the teaching of the reference.

6. In addition, independent method claim 23 clearly defines that the adjustment of the output frequency is performed in a loop, where the final frequency is aligned to a desired frequency. The text in col. 7 line 3 to col. 9 line 16 describes a real time clock for providing time/date information, and how this information is corrected based on the count value. In other words, the RTC itself corrects the time/date information.

In view of A-D and 1-6 above, the Applicant considers that rejection of independent claim 23 under 35 § 102 is improper.

Claims 24-26 depend on claim 23 and define additional elements that are not described exactly by the reference. Namely:

The reference does not describe incrementing the multiplier when the output frequency is less than the desired frequency, as in claim 24. The reference is not concerned with determining such corrected multiplier value in col. 6, lines 5-57. Rather, this text describes the steps performed by the RTC 220 for calculating an "adjusting period", representing the time between

corrections.

Also, the reference does not describe dividing the final frequency (corrected output frequency) by the corrected multiplier as in claim 25. As clearly described in col. 7 line 3 to col. 9, line 16, RTC 20 divides the crystal frequency twice, calculates the difference between the crystal frequency and that of a reference clock 270 to obtain a count value, used subsequently to calculate the length of time between corrections.

Furthermore, the reference does not describe storing the original frequency as in claim 10/9/7. It rather discloses storing the adjusting period.

As dependent on claim 23, and further in view of the above noted differences, the Applicant considers that rejection of dependent claims 24-26 under 35 § 102 is improper.

Independent apparatus claim 27

7. The preamble of claim 27 defines a device for adjusting an output frequency of a signal produced by a frequency source. As discussed above in connection with independent claim 17 (see above 1. and 2.), the reference does not describe a frequency source as in claim 27.

8. Claim 27 also defines a controller coupled to the frequency source for controlling the value of the multiplier. There is no multiplier described in the reference. Rather, the controller 580 of RTC 220 adjusts the dividing factor N by an amount r to delay or advance signal 570 (the real time clock).

9. Claim 27 further defines a frequency measurement device coupled to the frequency source; the arrangement of Figure 3 described in the col. 5, lines 11-67 of the reference is the RTC 220, so that it cannot also be the frequency measurement device.

10. Furthermore, the controller of claim 27 is coupled to the frequency source, while the controller 580 of the reference is part of RTC.

In view of A-D and 7-10 above, the Applicant considers that rejection of claim 11 under 35 § 102 is improper.

Claims 28-32 depend on claim 27 and define additional elements that are not described exactly by the reference.

Regarding claim 28, the Applicant could not find any reference to a frequency synthesizer in col. 5, lines 11-67.

The Examiner does not provide any grounds of rejection for claims 29 and 30 under 35 USC § 102. Notwithstanding, the specification of the reference is silent as to the embodiment of controller 580 or processing unit 230 defined in claim 29, or regarding integration of the device of Figure 1 into an ASIC.

Regarding claim 31, the memory of the reference is not used to store the input frequency, but the adjusting period. Furthermore, the reference does not measure the output signal with a frequency measuring device connected at the output of the frequency source as in claim 32.

As dependent on claim 27, and further in view of the above noted differences, the Applicant considers that rejection of dependent claims 12-16 under 35 § 102 is improper.

Response to rejection of claim 30 under 35 USC § 103

The Examiner alleges that claim 30 is obvious when the Ledfelt reference is considered in conjunction with the known art. However, as mentioned above, the differences between the elements of claim 30 and what is disclosed in the reference of record are important, so that if a person skilled in the art will pack the device of the reference into an ASIC, the result will be very different from the ASIC of claim 30. The ASIC of Ledfelt will still apply corrections to the time/date information at intervals calculated according to the fixed error of the respective

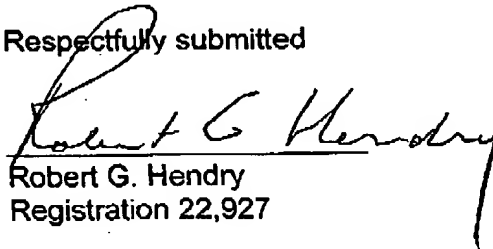
crystal. The ASIC of the invention will still provide a closed control loop for correcting any fixed and dynamic errors in the crystal frequency of the internal clock to ensure a good quality of the respective communication channel.

As dependent on claim 27, and further in view of the above noted differences, the Applicant considers that rejection of dependent claim 30 under 35 § 103(a) is improper.

In view of the above remarks and arguments, the Examiner is respectfully requested to reconsider the claims of the application.

Should any further fees or payments be necessary for entry of this amendment and further prosecution of this application, the undersigned hereby authorizes the Commissioner to debit and/or credit our Deposit Account No. 16-0600.

Respectfully submitted

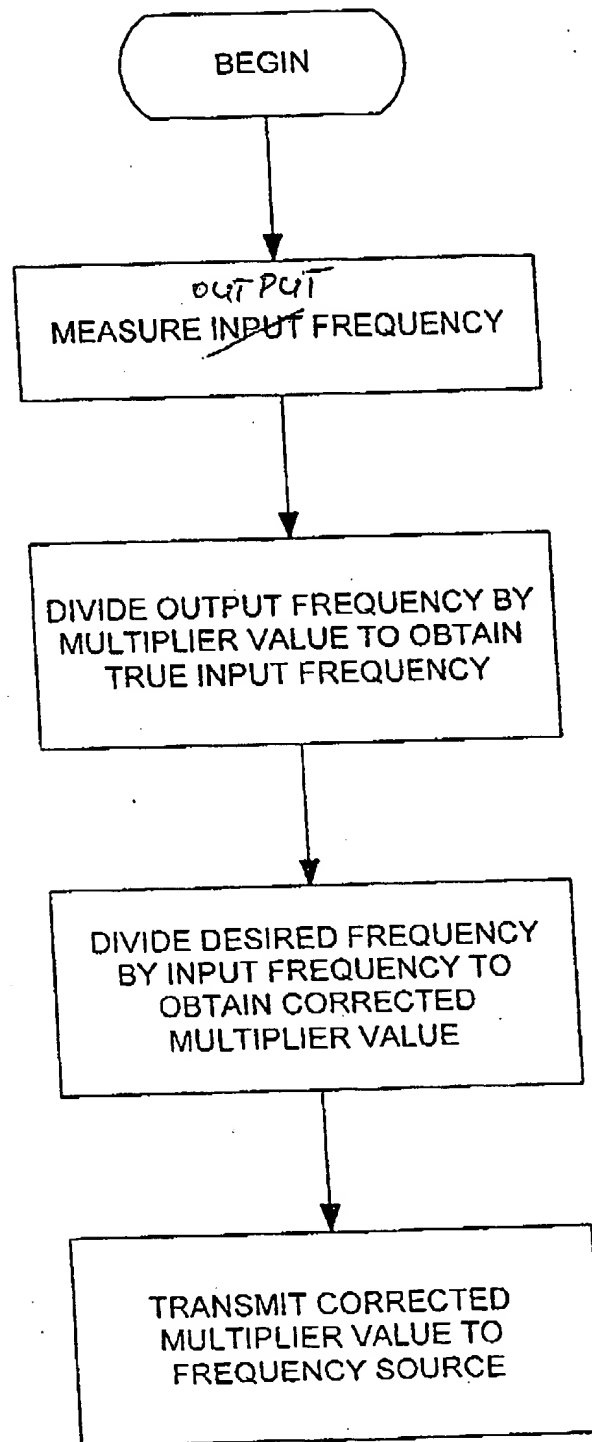


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**FIG. 2**